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Nota di contenuto	Cover -- Title Page -- Copyright Page -- CONTENTS -- Preface -- 1 Basic Counting Methods -- 1.1 The multiplication principle -- 1.2 Permutations -- 1.3 Combinations -- 1.4 Binomial coefficient identities -- 1.5 Distributions -- 1.6 The principle of inclusion and exclusion -- 1.7 Fibonacci numbers -- 1.8 Linear recurrence relations -- 1.9 Special recurrence relations -- 1.10 Counting and number theory -- Notes -- 2 Generating Functions -- 2.1 Rational generating functions -- 2.2 Special generating functions -- 2.3 Partition numbers -- 2.4 Labeled and unlabeled sets -- 2.5 Counting with symmetry -- 2.6 Cycle indexes -- 2.7 Pólya's theorem -- 2.8 The number of graphs -- 2.9 Symmetries in domain and range -- 2.10 Asymmetric graphs -- Notes -- 3 The Pigeonhole Principle -- 3.1 The principle -- 3.2 The lattice point problem and SET® -- 3.3 Graphs -- 3.4 Colorings of the plane -- 3.5 Sequences and partial orders -- 3.6 Subsets -- Notes -- 4 Ramsey Theory -- 4.1 Ramsey's theorem -- 4.2 Generalizations of Ramsey's theorem -- 4.3 Ramsey numbers, bounds, and asymptotics -- 4.4 The probabilistic method -- 4.5 Schur's theorem -- 4.6 Van der Waerden's theorem -- Notes -- 5 Error-Correcting Codes -- 5.1 Binary codes -- 5.2 Perfect codes -- 5.3 Hamming codes -- 5.4 The Fano Configuration -- Notes -- 6 Combinatorial Designs -- 6.1 t-designs -- 6.2 Block designs -- 6.3 Projective planes -- 6.4 Latin squares -- 6.5

MOLS and OODs -- 6.6 Hadamard matrices -- 6.7 The Golay code and  $S(5,8,24)$  -- 6.8 Lattices and sphere packings -- 6.9 Leech's lattice -- Notes -- A Web Resources -- B Notation -- Exercise Solutions -- References -- Index.

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## Sommario/riassunto

Praise for the First Edition "This excellent text should prove a useful accoutrement for any developing mathematics program . . . it's short, it's sweet, it's beautifully written." -The Mathematical Intelligencer "Erickson has prepared an exemplary work . . . strongly recommended for inclusion in undergraduate-level library collections." -Choice

Featuring a modern approach, Introduction to Combinatorics, Second Edition illustrates the applicability of combinatorial methods and discusses topics that are not typically addressed in literature, such as Alcuin's sequence, Rook paths, and Leech's lattice. The book also presents fundamental results, discusses interconnection and problem-solving techniques, and collects and disseminates open problems that raise questions and observations. Many important combinatorial methods are revisited and repeated several times throughout the book in exercises, examples, theorems, and proofs alike, allowing readers to build confidence and reinforce their understanding of complex material. In addition, the author successfully guides readers step-by-step through three major achievements of combinatorics: Van der Waerden's theorem on arithmetic progressions, Pólya's graph enumeration formula, and Leech's 24-dimensional lattice. Along with updated tables and references that reflect recent advances in various areas, such as error-correcting codes and combinatorial designs, the Second Edition also features: Many new exercises to help readers understand and apply combinatorial techniques and ideas A deeper, investigative study of combinatorics through exercises requiring the use of computer programs Over fifty new examples, ranging in level from routine to advanced, that illustrate important combinatorial concepts Basic principles and theories in combinatorics as well as new and innovative results in the field

Introduction to Combinatorics, Second Edition is an ideal textbook for a one- or two-semester sequence in combinatorics, graph theory, and discrete mathematics at the upper-undergraduate level. The book is also an excellent reference for anyone interested in the various applications of elementary combinatorics.

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